WATERSPOUT.

The schooner *Metha Nelson*, which arrived February 19 at San Francisco, Cal., from Makaweli, Kauai, Hawaiian Islands, encountered a waterspout on Sunday February 18, when 30 miles northwest of Point Reyes. Captain Rice states that:

On Sunday morning his vessel was pursued by a column of water which emitted flashes of lightning, and was preceded by a thin curling sea. The weather for the preceding twenty-four hours had been a succession of rain squalls, but the sea was moderate and the weather not unusual for this time of the year.

When the spout first appeared it was some distance astern, according to an account given by the mate, and apparently bearing directly down upon the schooner. There was just time to make everything fast when the great swirling mass of water was close astern and towering over the little vessel. Then, by some strange good fortune, it suddenly changed its course and swept by, only catching the spanker boom and carrying it away. The schooner was thrown on her beam ends by the disturbance of the water but soon righted herself and continued on her course.

OBJECTIONABLE METEOROLOGICAL TERMS.

We notice in a newspaper from Ashland, Oreg., the expression "The buran or snow-hurricane of the Pamirs." The accompanying description of the buran is quite correct, and it evidently corresponds very nearly to the blizzard of North America. The blizzard is not merely a cold wind, but it must be accompanied by blinding snow, no matter whether it is falling freshly from the sky or drifting along over the ground. It is tautology to speak of a "snow buran" or a "snow blizzard." The hurricane is not merely a strong wind, but is a revolving wind of the cyclonic type, whereas the winds of the blizzards almost always blow more nearly in straight lines, outward from the region of high pressure. It is perfectly proper to speak of a buran, a blizzard, a typhoon, a West India hurricane, as separate types of storms. The buran is one form of snowstorm, but it is not in any sense a hurricane.

DANGER LINES ON GAGES AND CONTOUR LINES ON CITY MAPS.

In connection with the high water at Albany, N. Y., early in March, the Times-Union of that city says:

The Weather Bureau observer, Mr. A. F. Sims, has what he calls the danger line, and many inquiries were made at the office from merchants along Broadway in regard to the water. Mr. Sims' forecasts came true in regard to the freezing temperatures, and this morning the merchants were praising him for sparing them much trouble. Mr. Sims has a system by which he can tell the merchants of different stores along Broadway how much higher the water will have to come before it will affect their store floors or their boilers. He is keeping a close watch on the river, and as soon as there is any danger of a flood will inform the merchants who are in danger. This system is greatly appreciated, for it saves them much time and worry.

It would seem that if there is available a map of any city showing the contour lines foot by foot, up to the highest water level, it would be convenient for our observers to specify what streets or cellars will be flooded for any given height of water above the danger line.

THE LEGAL VALUE OF WEATHER BUREAU RECORDS.

Very few persons realize how very frequently the records of the Weather Bureau are appealed to by the courts. Prof. H. J. Cox, in charge of the station at Chicago, Ill., states that:

Since the opening of the present term of court, last fall, I have been in court thirty-three times to testify as to the condition of the weather at a particular time and as to what bearing it might have on the case at issue. In addition to these thirty-three cases many cases are settled out of court on the records of the weather department. Such cases are principally damage suits arising from the shipment of perishable goods. Every day we have from eight to ten telephone calls and numerous letters from commission merchants asking as to the weather conditions on particular dates and the claims are usually settled accordingly.

SUDDEN TEMPERATURE CHANGES IN MONTANA.

Mr. C. W. Ling, observer in charge of the Weather Bureau station at Havre, Mont., calls attention to the sudden rise and fall in temperature on March 7 and 8 at that station. The minimum recorded by the thermograph in the early morning of March 6 was about −15° and the general curve for that day had the normal characteristics. On March 7, at 2:45 a.m. seventy-fifth meridian time, there was a sudden rise within three minutes from + 11° to + 42°, where the temperature remained nearly stationary until 12:30 p. m., when it fell in three minutes from + 44° to + 18°, and in twenty minutes more to + 11°. The temperature curve then remained nearly normal until about 5 a. m. of March 8, when it began to rise rapidly, ascending from + 20° to + 40° at 6 a. m.; but in a few hours, viz, at 10:30 a. m., it began falling rapidly, and in one hour and thirty minutes passed from + 43° down to + 9°. The rapid rises on the 7th and 8th were due to the southeast and southwest foehn winds that are so common in this neighborhood; the rapid falls that followed them are said by the observer to have been caused by cold waves. It does not appear that these cold waves always advance far southward. Sometimes they are quite local and may represent the surging north and south of the cold air that covers the lowlands north and east of Havre, which latter station is located about 2,500 feet above sea level.

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Professor of Meteorology.

The weather of the current month east of the Rocky Mountains was for the most part cold and disagreeable. In the Gulf States and Florida there was much rain but no abnormally low temperatures. West of the Rocky Mountains it was warmer than usual with less than the normal amount of rain, except on the coasts of Washington and Oregon. Less than the average amount of snow fell in all districts, except the lower Lake region, the upper Missouri Valley, and northern New England. The number of thunderstorms and severe local storms was remarkably small.

PRESSURE.

The distribution of monthly mean pressure is graphically shown on Chart IV, and the numerical values are given in Tables I and II.

Mean pressure was highest, 30.18 inches, in the upper Missouri Valley, whence it diminished to 30.00 inches on the Pacific coast, and to 29.90 over the Gulf of St. Lawrence. As compared with the normal, mean pressure was in excess throughout the eastern two-thirds of the United States by amounts varying from one to seven and eight hundredths of

an inch. West of the Rocky Mountains there was a deficit of about the same amount.

During the first ten days, and again during the closing days of the month, pressure was low throughout the Pacific coast and Plateau regions. Areas of high pressure during those periods generally moved southeastward over the eastern slope of the Rockies or directly eastward by way of the Lake region.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

Temperature was above normal in practically all of the districts west of the ninety-fifth meridian and below in the districts to the eastward, save Nova Scotia and southeastern Florida. The negative departures for the current month were not so great as those of the previous month, but covered very much the same extent of territory. The area of positive departures likewise covered the same portions of the country as during the preceding month. A slight eastward movement in both areas was noted. The greatest positive departures in February were in Oregon; in March, in southern Idaho. The greatest negative departures in February were in western Wisconsin; in March, in Lower Michigan and western New York.

In Canada.—Prof. R. F. Stupart says:

The mean temperature of the month was lower than average by 3° to 6° in the Provinces of Quebec and Ontario, the largest departures being in the upper Ottawa Valley and in Nipissing district. In British Columbia and southern Alberta it was higher than average by a corresponding amount, while in Manitoba and the larger portion of the Territories, and also in the Maritime Provinces, it varied from just average to a degree or so either above or below. The difference from average of 6° in Ontario is large, but scarcely as exceptional as many seem to suppose. In March, in the years 1895 and 1896, the mean temperature over the larger portion of the Province was lower than this year, and in 1885 it was very much lower. British Columbia records indicate, however, that a departure from average of 6° in that Province is very exceptional.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	31.3	− 1.6	+ 0.7	+ 0.2
Middle Atlantic	12	37.2	− 2.2	− 1.8	− 0.6
South Atlantic	10	52.6	− 1.0	− 5.2	− 1.7
Florida Peninsula	7	63.6	− 1.5	− 6.7	− 2.2
East Gulf	7	57.0	− 1.4	− 7.5	− 2.5
West Gulf	7	57.9	+ 0.1	+ 0.4	+ 0.1
Ohio Valley and Tennessee	12	41.2	− 2.7	− 5.1	− 1.7
Lower Lake	8	26.7	− 5.6	− 5.6	− 1.9
Upper Lake	9	23.2	− 3.4	− 1.1	− 0.4
North Dakota	8	21.1	+ 0.8	+11.4	+ 3.8
Upper Mississippi Valley	11	33 4	− 2.5	− 0.8	− 0.3
Missouri Valley	10	36.4	+ 0.6	+ 6.4	+ 2.1
Northern Slope	7	35.5	+ 3.7	+15.5	+ 5.2
Middle Slope	6	44.3	+ 2.0	+ 8.8	+ 2.9
Southern Slope	6	51.4	+ 1.0	+ 5.9	+ 2.0
Southern Plateau	15	52.5	+ 4.7	+13.5	+ 4.5
Middle Plateau	9	44.4	+ 6.4	+18.8	+ 6.3
Northern Plateau	10	44.0	+ 6.6	+18.6	+ 6.2
North Pacific	9	49.2	+ 3.9	+11.8	+ 3.9
Middle Pacific	5	54.7	+ 2.4	+ 7.2	+ 2.4
South Pacific	4	59.2	+ 3.8	+10.3	+ 3.4

PRECIPITATION.

Precipitation was generally below normal, the notable exceptions being in Florida, the west Gulf States, North Dakota, the north Pacific coast, and the lower Lake region. In no district, however, was the deficiency so great as to work immediate injury to agricultural interests. In the majority of the grain producing States, in the central valleys and on the eastern seaboard the total fall was about 75 per cent of the normal. Monthly totals of over 10 inches were recorded in Florida and Texas and on the north Pacific coast. The precipitation in the Rocky Mountains and Plateau regions was light.

The snowfall of the month east of the Mississippi was not large, except in the Appalachian and lower Lake regions. The fall in the upper Mississippi and upper Missouri valleys was considerably above the average. On the plains and generally throughout the Rocky Mountain and Plateau regions the fall was scant and irregularly distributed.

At the close of the month there was considerable snow on the ground in eastern South Dakota and northern Iowa, in the Upper Peninsula of Michigan, locally throughout northern Ohio, and in northern New England.

In Canada.—Professor Stupart says:

In British Columbia the precipitation was, in most localities, unusually heavy, especially in the lower Fraser Valley, where it ranged between 6 and 10 inches. At Victoria over 2 inches fell between the 9th and 11th, and from 5 to 6 inches in thirty-six hours was reported from Vancouver and New Westminster on the 10th and 11th. In the Northwest Territories and Manitoba the precipitation was, as is usual in March, wholly snow. This, during the first ten days, was fairly heavy in northern Alberta and also in parts of Assiniboia, amounting to 34 inches at Edmonton, 14 inches at Qu'Appelle, and 10 at Medicine Hat. In Manitoba, generally, it was about 7 inches, and in Saskatchewan a somewhat smaller amount. From Ontario eastward a much heavier precipitation occurred in the southern than in the northern portions of the Province. In Ontario it was partly snow and partly rain; in Quebec chiefly snow, and in the Maritime Provinces almost wholly rain. In eastern Nova Scotia the total fall was double the average. The depth of snow on the ground is still considerable in northern Ontario and in Quebec, but all has nearly gone from the Northwest Territories and Manitoba, and also from southern Ontario. Heavy drifts still continue, however, in sheltered places. Ice reports are rather meager, but from those received it is evident that rivers in the Northwest Territories and Manitoba which are not already open soon will be. There is but 10 inches of ice at Battleford.

The total depth of snow for the month, and the amount on the ground at the end of the month are shown by Charts No. VIII and IX, respectively, and the numerical values appear in Table II.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	10	4.30	108	+0.3	+2.9
Middle Atlantic	12	3.58	92	−0.3	−0.7
South Atlantic	10	4.49	100	0.0	−0.3
Florida Peninsula	7	6.47	284	+3.7	+4.9
East Gulf	7	5.43	92	−0.5	+0.2
West Gulf	7	4.05	121	+0.7	−0.3
Ohio Valley and Tennessee	12	2.59	60	−1.7	−3.7
Lower Lake	8	2.93	116	+0.4	+1.5
Upper Lake	9	1.29	62	−0.8	−1.1
North Dakota	8	1.86	117	+0.2	−0.5
Upper Mississippi Valley	11	1.74	78	−0.5	−0.5
Missouri Valley	10	1.33	77	−0.4	−0.7
Northern Slope	7	0.60	75	−0.2	−0.6
Middle Slope	6	0.70	47	−0.8	−1.2
Southern Slope	6	0.73	71	−0.3	−1.3
Southern Plateau	15	0.46	40	−0.7	−2.2
Middle Plateau	9	0.36	25	−1.1	−2.2
Northern Plateau	10	1.08	64	−0.6	−1.7
North Pacific	9	6.34	114	+0.8	−1.5
Middle Pacific	5	2.85	58	−1.7	−4.3
South Pacific	4	1.14	53	−1.0	−5.0

HAIL.

The following are the dates on which hail fell in the respective States:

Arizona, 2, 6, 17, 18, 20, 21, 22, 23. Arkansas, 14, 19. California, 3, 4, 20, 21, 22, 23, 25, 26, 27. Florida, 9. Idaho, 2, 3, 6, 8, 25, 26, 27. Illinois, 1, 27, 28. Indiana, 6, 25, 28. Indian Territory, 6. Kansas, 5, 25, 26. Kentucky, 19.

Louisiana, 15, 16, 18, 19. Michigan, 5, 22. Mississippi, 19. Missouri, 6, 23, 28. Nebraska, 24, 27, 28. Nevada, 2, 21, 23. New Mexico, 21, 22. Ohio, 5, 19, 28, 29. Oregon, 3, 4, 5, 21, 25, 26, 27. Tennessee, 14, 19, 20, 30. Texas, 21, 22, 25, 29. Utah, 4, 5, 23, 26. Washington, 4, 5, 25, 26, 27, 28. West Virginia, 25, 26, 29.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 15. Arizona, 20. Arkansas, 13, 14. California, 3, 7, 22, 25. Colorado, 4, 5, 22, 23, 24, 26, 27, 28. Connecticut, 1, 6, 15, 16. Delaware, 15, 26, 31. District of Columbia, 16. Georgia, 15. Idaho, 3. Illinois, 4, 5, 6, 18, 25, 27, 28, 29. Indiana, 4, 5, 6, 18, 25, 27, 28, 29, 30. Iowa, 3, 4, 5, 6, 7, 24, 26, 27, 28, 29. Kansas, 3, 4, 5. Kentucky, 1, 2, 28, 30. Louisiana, 15, 16. Maine, 1, 2, 6, 10, 15, 16. Maryland, 8, 15, 16, 25, 26, 29. Massachusetts, 1, 6, 15, 16. Michigan, 5, 6, 9, 17, 18, 19. Minnesota, 5. Mississippi, 15. Missouri, 5, 6, 16, 22, 29, 30. Montana, 3. Nebraska, 3, 4, 5, 6, 7, 14, 27, 28, 29, 30. New Hampshire, 1, 2, 3, 6, 7, 16. New Jersey, 6, 15, 16, 18, 26, 30. New Mexico, 21. New York, 1, 3, 6, 15, 19, 27. North Carolina, 8, 13, 14, 15, 16. North Dakota, 24. Ohio, 1, 4, 5, 6, 25, 26, 28, 29, 30. Oklahoma, 14. Pennsylvania, 1, 5, 6, 15, 16, 26. South Dakota, 26, 27. Tennessee, 4, 22, 30. Texas, 14, 15, 21, 22. Utah, 5, 26. Vermont, 1, 6, 16. Virginia, 1, 8, 9, 11, 14, 15, 16, 25, 29, 30, 31. Washington, 6, 24, 25, 26. West Virginia, 1, 11, 25, 27, 29, 31. Wisconsin 5, 6, 10, 25, 26. Wyoming, 5, 26, 27.

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	4.8	−0.8	Missouri Valley	4.9	−0.7
Middle Atlantic	5.4	−0.1	Northern Slope	5.0	−0.3
South Atlantic	5.2	+0.5	Middle Slope	4.5	+0.1
Florida Peninsula	5.3	+1.3	Southern Slope	5.0	+0.8
East Gulf	5.5	+0.8	Southern Plateau	3.4	+0.4
West Gulf	5.8	+0.6	Middle Plateau	3.7	−1.2
Ohio Valley and Tennessee	6.1	+0.2	Northern Plateau	5.4	−1.1
Lower Lake	6.4	0.0	North Pacific Coast	6.4	−0.2
Upper Lake	6.2	+0.3	Middle Pacific Coast	5.4	+0.4
North Dakota	5.6	+0.1	South Pacific Coast	4.2	−0.3
Upper Mississippi	5.5	0.0			

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table VII, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 740 thunderstorms were received during the current month as against 2,125 in 1899 and 703 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 19th, 78; 27th, 69; 24th and 25th, 58; 26th, 56.

Reports were most numerous from: Texas, 67; Florida, 61; Kansas, 59; Nebraska, 57.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 11th to 19th.

The greatest number of reports were received for the following dates: 29th, 10; 8th and 12th, 8.

Reports were most numerous from New Hampshire, 8; New York, 7; Massachusetts, 5.

In Canada.—Auroras were reported as follows: Father Point, 23d; Quebec, 8th, 23d, 29th; Toronto, 23d; Minnedosa, 2d, 4th, 8th, 19th, 30th; Medicine Hat, 4th, 28th; Banff, 12th; Battleford, 13th, 29th; Barkerville, 12th.

Thunderstorms were reported from Hamilton, Bermuda, on the 12th, 15th, 28th.

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	5	50	w.	Hatteras, N. C.	1	51	se.
Buffalo, N. Y	6	57	w.	Do.	12	50	n.
Do.	7	54	w.	Helena, Mont.	1	58	w.
Do.	17	52	w.	Mount Tamalpais, Cal.	22	51	nw.
Do.	19	51	w.	Do.	27	53	nw.
Do.	20	60	w.	New York, N. Y.	1	56	e.
Carson City, Nev	7	58	w.	Do.	2	60	nw.
Do.	8	56	w.	Do.	3	63	nw.
Do.	25	50	sw.	Do.	7	50	nw.
Do.	26	50	sw.	Do.	28	50	nw.
Chicago, Ill	6	53	sw.	Norfolk, Va.	1	55	se.
Denver, Colo	5	51	nw.	Pierre, S. Dak	1	52	nw.
Eastport, Me.	1	54	e.	Point Reyes Lt., Cal.	22	72	nw.
Do.	2	66	e.	Sioux City, Iowa	19	50	nw.
Do.	16	58	s.				

HUMIDITY.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	69	− 6	Missouri Valley	68	− 4
Middle Atlantic	69	− 2	Northern Slope	63	− 3
South Atlantic	75	+ 1	Middle Slope	61	+ 1
Florida Peninsula	80	+ 2	Southern Slope	60	+ 4
East Gulf	70	− 4	Southern Plateau	35	− 5
West Gulf	73	+ 3	Middle Plateau	39	−15
Ohio Valley and Tennessee	71	+ 1	Northern Plateau	65	− 5
Lower Lake	76	0	North Pacific Coast	78	− 2
Upper Lake	80	+ 2	Middle Pacific Coast	75	− 1
North Dakota	79	+ 2	South Pacific Coast	71	− 3
Upper Mississippi	76	+ 5			

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Professor of Meteorology.

For description of tables and charts see page 26 of REVIEW for January, 1900.